



UNITED STATES PATENT AND TRADEMARK OFFICE.

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/550,316

09/22/2005

Atsushi Maeda

Q89924

1764

65565 7590 11/16/2007
SUGHRUE-265550
2100 PENNSYLVANIA AVE. NW
WASHINGTON, DC 20037-3213

EXAMINER

ARCE DIAZ, MARLON A

ART UNIT

PAPER NUMBER

3611

MAIL DATE

DELIVERY MODE

11/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/550,316	MAEDA ET AL.	
	Examiner	Art Unit	
	Marlon A. Arce-Diaz	3611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>9/22/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
2. Claim 1-7 recite the limitation "one of bearings" in different lines within each claim. There is insufficient antecedent basis for this limitation in the claim.
3. Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Examiner does not see and understands the reason why applicant would claim the clearance on the sides of the worm wheel.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 8-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Shimizu (JP 2003-054431). Shimizu discloses a power steering device comprising: an electric motor (9), an hourglass worm gear (26), a worm wheel (24) and a plurality of bearings (25). Regarding claim 16-19, Shimizu further mentions in Paragraphs 18-21, that the hourglass worm gear moves in relation to rotational resistance from the motor, meaning that the hourglass worm gear moves in order to accommodate a bigger contact area between the worm gear and the worm wheel; also, the hourglass worm gear is made out of synthetic resin (as mentioned in Par 21), which, would enable a deformation elastically. Regarding claim 20, Shimizu discloses a change in tooth thickness is mentioned in Paragraphs 17 and 21. regarding claim 21 and 22, the tooth thickness adjustment in Shimizu and mentioned in Paragraphs 17 and 21 is related to the pitch diameter relation between the worm gear and the worm wheel as seen in applicants drawings (specifically in 40A to 43B). Regarding claim 10, it is inherent to someone skilled in the art to try different types of lubricant in order to find the one that would prolong the life of the gearing; in this case grease with a consistency of 385. Regarding claim 11, figure 3 shows that the width of the worm wheel is bigger than the one of the worm gear. Regarding claim 13, it is inherent to say that the motor (9) is a brushless motor.

3. Claims 8-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Eda Hiroshi (JP 09-132154). Eda discloses a motor-driven power steering comprising: a motor (13) with an output shaft (13A), a worm gear system made out a hourglass worm gear (6) and a worm wheel (5). Regarding claim 8, Eda shows in figure 2 that the teeth on the worm gear have a special conical profile; also, the teeth intersect with the worm wheel (5). Regarding claim 10, it is inherent to someone skilled in the art to try different types of lubricant in order to find the one that would prolong the life of the gearing; in this case grease with a consistency of 385. Regarding claim 11, the width of the worm wheel is notably larger than the width of the hourglass worm gear, as seen in figure 2. Regarding claim 15, Eda further discloses that the adjustment screw (9) in respect to the housing (2) would adjust the backlash.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu (JP 2003-054431) in view of Duta (US 5836076). Shimizu mentioned above fails to mention the tapered bearing. Duta discloses an aligning system comprising: an hourglass worm gear (Fig 2), a tapered bearing (75), a bearing holder (Fig 2) that has an inner ring (370, Fig 13); wherein, the inner ring is taper surface in order to accommodate the tapered bearing. It would have been obvious for someone of ordinary

skilled in the art to know that worm gears (speed reduction gear mechanisms) when connected to housings/bearing holders, need a bearing in order to be able to rotate; also the use of tapered bearings in combination with worm gears are well known in the mechanical art. It would have been obvious for someone skilled in the art to know that a tapered bearing would be a good fit for the steering system as claimed by applicant, in order to be able to move/slide freely and to have a better mechanical connection between the housing and the worm gear.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Elias (US 4089216). Elias discloses a load measurement device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marlon A. Arce-Diaz whose telephone number is (571) 272-1341. The examiner can normally be reached on Mon-Fri 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lesley Morris can be reached on (571) 272-6651. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Application/Control Number:
10/550,316
Art Unit: 3611


Page 6

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Marlon Arce-Diaz

11/7/07

MAA


LESLEY D. MORRIS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 3600